SECTION 05400

COLD-FORMED METAL FRAMING

GENERAL

SECTION INCLUDES

Cold-formed metal framing for wall, including studs, tracks, headers, bridging, and related accessories.

RELATED SECTIONS

Section 06100 - Rough Carpentry.

Section 07210 - Building Insulation.

Section 09110 - Non-Load Bearing Wall Framing.

Section 09260 – Gypsum Board Assemblies.

REFERENCES

ASTM A 780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

ASTM A 1003 - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.

ASTM B 633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

ASTM C 955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.

ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

ASTM C 1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

AISC - LRFD Manual of Steel Construction.

AISI - Specification for the Design of Cold-Formed Steel Structural Members; 1996.

AWS D.1.3 - Structural Welding Code - Sheet Steel.

PERFORMANCE REQUIREMENTS

AISI “Specifications”: Calculate structural characteristics of cold-formed steel truss members according to AISI’s “Specification for the Design of Cold-Formed Steel Structural Members, 1996.”

Structural Performance: Design, engineer, fabricate, and erect cold-form steel floor framing to withstand specified design loads within limits and under conditions required.

Design Loads as required by local code and as indicated on the Drawings.
Deflection Limits:
Wall Framing: Per requirements of finish material.
Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to maximum ambient temperature change (range) of 120 degrees F (67degrees C).

SUBMITTALS

Submit under provisions of Section 01300.

Product Data: Submit manufacturer's product literature, data sheets and installation recommendations for specified productseach type of cold-formed steel framing item required.

Structural Calculations: Submit structural calculations prepared by the cold-formed steel manufacturer for approval by the Architect and Engineer of Record. Submittal shall be sealed by a professional engineer registered in the state of the project.
Description of design criteria.
Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application.
Selection of framing components, accessories and welded connection requirements.
Verification of attachments to structure and adjacent framing components.
Engineer shall have a minimum of 5 years experience with projects of similar scope.

Shop Drawings:
Submit shop drawings prepared by the cold-formed steel manufacturer for approval by the Architect and Engineer of Record showing plans, sections, elevations, layouts, profiles and product

component locations, including anchorage, bracing, fasteners, accessories and finishes.
Show connection details with screw types and locations, weld lengths and locations, and other fastener requirements.
Submit wall panel drawings for pre-fabricated panels showing panel layout, elevation, material and location. Where prefabricated panels are to be provided, provide drawings depicting panel configurations, dimensions and locations.

QUALITY ASSURANCE

Fabricator Qualifications: Fabrication shall be performed by a cold-formed steel truss fabricator with experience designing and fabricating cold-formed steel wall truss systems equal in material, design, and extent to the systems required for this project.

Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer's installation instructions.

Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code—Steel" and AWS D1.3 "Structural Welding Code—Sheet Steel."
Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

DELIVERY, STORAGE, AND HANDLING

Deliver materials in manufacturer's original, unopened, undamaged containers or bundles, fully identified by name, brand, type and grade. with identification labels intact.

Exercise care to avoid damage during unloading, storing, and erection.

Store materials protected from exposure to rain, snow or other harmful weather conditions, with proper ventilation to avoid condensation. at temperature and humidity conditions.

Store materials off the ground with sufficient bracing to avoid damage from excessive bending.
Protect joists and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep joists free from dirt and foreign matter.

PROJECT CONDITIONS

Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

During construction, adequately distribute all construction loads applied to joists so as not to exceed the carrying capacity of any one light gage steel member or joist or other component.

PRODUCTS

MANUFACTURERS

VanderWal Homes & Commercial Group
4427 VanderWal Drive
Petrolia, ON N0N 1R0
1-877-251-6875
FAX 519-882-4153
Website: http://www.trusses.ca

Manufacturing Locations

- Petrolia
- Alberta
- New Brunswick

Contacts

Mr. Jim VanderWal : info@trusses.ca

Mrs. Mary VanderWal

Service Area

·Alberta · British Columbia · Manitoba · New Brunswick · Newfoundland · Northwest Territories · Nova Scotia · Ontario · Quebec · Saskatchewan · Yukon Territory ·

Products - Cold Formed Trusses - Cold Formed Wall Panels - Cold-Formed Floors

Substitutions: Not permitted.

Requests for substitutions will be considered in accordance with provisions of Section 01600.

COMPONENTS

Studs: Cold- formed galvanized steel C-studs:

Size: 1-3/8 inch (35 mm) flange width, 3/8 inch (9.5 mm) returns, and web depth as indicated on drawings; Series CWN.
Size: 1-5/8 inch (41 mm) flange width, 1/2 inch (12.7 mm) returns, and web depth as indicated on drawings; Series CSJ.
Size: 2 inches (51 mm) flange width, 5/8 inch (15.9 mm) returns, and web depth as indicated on drawings; Series CSW.
Size: 2-1/2 inch (64 mm) flange width, 5/8 inch (15.9 mm) returns, and web depth as indicated on drawings; Series CSE.
Size: 3 inch (76 mm) flange width, 1 inch (25.4 mm) returns, and web depth as indicated on drawings; Series CSS.
Sizes: As indicated on drawings.
Size: _____.

Minimum Yield Strength: 33 ksi (227 MPa) (for 20 through 18 gauges).
Minimum Yield Strength: 50 ksi (345 MPa) (for 16 through 12 gauges).
Minimum Yield Strength: As required for design.

Minimum Delivered Thickness: 20 gauge, 0.0329 inch (0.84 mm).
Minimum Delivered Thickness: 18 gauge, 0.0428 inch (1.09 mm).
Minimum Delivered Thickness: 16 gauge, 0.0538 inch (1.37 mm).
Minimum Delivered Thickness: 14 gauge, 0.0677 inch (1.72 mm).
Minimum Delivered Thickness: 12 gauge, 0.0966 inch (2.45 mm).

Track: Cold- formed galvanized steel Track:

Designation: TSB Standard Leg 1 1/4 inches (32 mm) high.
Designation: Equal Leg.
Designation: Unequal Leg.
Designation: Custom size up to 3 inches (76.2 mm) high.
Designation: Slip Track (SLP-TRK®)

Minimum Yield Strength: 33 ksi (227 MPa) (for 20 through 12 gauges only).
Minimum Yield Strength: 50 ksi (345 MPa) (for custom order only).
Minimum Yield Strength: As required for design.
Web Sizes: As required to match the system stud size.
Material thickness to match stud/joist thickness unless design dictates heavier thickness.

Sliptrack Systems – Slotted Deflection Track:

Standard leg of 2 1/2 inches.
Standard vertical slot of 1 1/2 inches in leg.
Product available with 2 1/2 drift slots in web 'special order.'
Minimum yield strength of 33 k.s.i. in 18 gauge and lighter and
Minimum yield strength of 50 k.s.i. in 16 gauge and heavier.

Deflection Clips:

Slide Clips: Minimum Delivered Thickness: 14 gauge, 0.0677 inch (1.72 mm).
Slide Clips: Minimum Delivered Thickness: 12 gauge, 0.0966 inch (2.45 mm).
Fast Top Clip: Minimum Delivered Thickness: 14 gauge, 0.0677 inch (1.72 mm)
Fast Strut Clip: Minimum Delivered Thickness: 14 gauge, 0.0677 inch (1.72 mm)
Fast ClipSlide Clip: Minimum Delivered Thickness: 14 gauge, 0.0677 inch (1.72 mm)
QuickClip: Minimum Delivered Thickness: 10 gauge, 0.1180 inch (3 mm)

Clip Angles (Support Clips) EasyClip® Series: Minimum Delivered Thickness: 16 gauge, 0.0538 inch (1.37 mm); 14 gauge, 0.0677 inch (1.72 mm); 12 gauge, 0.0966 inch (2.45 mm).
EasyClip® A Series
Size: 3 by 3 by 3 inches (76.2 by 76.2 by 76.2 mm)
Size: 3 by 3 by 6 inches (76.2 by 76.2 by 152 mm)
EasyClip® U Series
Size: 1-1/2 by 1-1/2 by 3-3/8 inches (38.1 by 38.1 by 85.7 mm)
Size: 1-1/2 by 1-1/2 by 5-3/4 inches (38.1 by 38.1 by 146 mm)
Size: 1-1/2 by 1-1/2 by 7-3/4 inches (38.1 by 38.1 by 197 mm)
Size: 1-1/2 by 1-1/2 by 9-3/4 inches (38.1 by 38.1 by 248 mm)
EasyClip® B Series
Size: 1-1/2 by 1-1/2 by 3 inches (38.1 by 38.1 by 76.2 mm)
Size: 1-1/2 by 1-1/2 by 5-1/4 inches (38.1 by 38.1 by 133 mm)
Size: 1-1/2 by 1-1/2 by 7-1/4 inches (38.1 by 38.1 by 184 mm)
Size: 1-1/2 by 1-1/2 by 9-1/4 inches (38.1 by 38.1 by 235 mm)
EasyClip® X Series
Size: 2 by 2 by 3-3/8 inches (50.8 by 50.8 by 85.7 mm)
Size; 2 by 2 by 5-3/4 inches (50.8 by 50.8 by 146.0 mm)
Size: 2 by 2 by 7-3/4 inches (50.8 by 50.8 by 196.8 mm)
Size: 2 by 2 by 9-3/4 inches (50.8 by 50.8 by 247.6 mm)
EasyClip® S Series
Size: 1-1/2 by 1-1/2 by 3 inches (38.1 by 38.1 by 76.2 mm)
Size: 1-1/2 by 1-1/2 by 5 inches (38.1 by 38.1 by 127 mm)
Size: 1-1/2 by 1-1/2 by 7 inches (38.1 by 38.1 by 178 mm)
Size: 1-1/2 by 1-1/2 by 9 inches (38.1 by 38.1 by 229 mm)
Size: 1-1/2 by 1-1/2 by 11 inches (38.1 by 38.1 by 279 mm)
EasyClip® E Series
Size: 4 by 1-1/2 by 3 inches (101 by 38.1 by 76.2 mm)
Size: 4 by 1-1/2 by 5 inches (101 by 38.1 by 127 mm)
Size: 4 by 1-1/2 by 7 inches (101 by 38.1 by 178 mm)
Size: 4 by 1-1/2 by 9 inches (101 by 38.1 by 229 mm)
Size: 4 by 1-1/2 by 11 inches (101 by 38.1 by 279 mm)

U-Channel:
Size: 3/4 inches (19.1 mm).
Size: 1-1/2 inches (38.1 mm).
Size: 2 inches (51 mm).
Length: Manufacturer's standard length.
Minimum Delivered Thickness: 16 gauge, 0.0538 inch (1.37 mm)

Bridging/Spacer Bar: TradeReady® Spazzer® 5400 Bridging and Bracing Bar.
Minimum Delivered Thickness: 16 gauge, 0.0538 inch (1.37 mm).
1-1/4 by 1-1/4 by 50 inches (32 by 32 by 1270 mm) long pre-notched at 12, 16 by and 24 inch (305 by 406 by 610 mm) centers.
TradeReady® Spazzer® Bar Guard: Minimum Delivered Thickness: 20 gauge, 0.0329 inch (0.84 mm).

Load-Bearing Headers:;

TradeReady® Load-Bearing Header (Cold-formed galvanized one-piece load-bearing header).
Size: 3-7/8 inches (98 mm) wide with 8 inch (203 mm) legs.
Size: 3-7/8 inches (98 mm) wide with 12 inch (305 mm) legs.
Size: 6-1/4 inches (159 mm) wide with 8 inch (203 mm) legs.
Size: 6-1/4 inches (159 mm) wide with 12 inch (305 mm) legs.
Minimum Delivered Thickness: 14 gauge, 0.0677 inch (1.72 mm), minimum.

L-Header (Cold-formed galvanized one-piece load-bearing header)
Size: 1-1/2 inches by 6 inches, manufactured in 18 gauge (0.0428), 16 gauge (0.0538) and 14 gauge (0.0677)
Size: 1-1/2 inches by 8 inches, manufactured in 18 gauge (0.0428), 16 gauge (0.0538) and 14 gauge (0.0677)
Size: 1-1/2 inches by 10 inches, manufactured in 18 gauge (0.0428), 16 gauge (0.0538) and 14 gauge (0.0677)

Framing Component Accessories: Provide the following accessories as required for a complete system.
Flat Strapping.
Angles, Plates, Sheets.
Custom Brake-Formed Shapes.

Fasteners: Self-drilling, self-tapping screws; Steel, complying with ASTM C15131002; Galvanized coating, plated or oil-phosphate coated complying with ASTM B 633 as needed for required corrosion resistance.

Touch-Up Paint: Zinc rich, containing 95-percent metallic zinc, ZRC 350 as manufactured by ZRC Worldwide, Marshfield, MA.

MATERIALS

Cold-Formed Steel Sheet: Complying with ASTM A 1003/A 1003M; unless indicated otherwise.

Galvanized Coating: G60 coating weight minimum, complying with ASTM C 955.

Galvanized Coating: G90 coating weight minimum, complying with ASTM C 955.

FABRICATION

Factory fabricate cold-formed steel wall panels plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and the requirements of this Section.
Fabricate wall panel assemblies in jig templates.
Fabricate wall panels in a controlled environment, protected from exposure to harmful weather conditions and free from dirt or other foreign matter.
Cut cold-formed steel members by sawing, shearing or plasma cutting.
Fasten cold-formed steel members by welding or screw fastening, or other methods as standard with fabricator. Wire tying of framing members is not permitted.
a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to manufacture's instructions with screw penetrating joined members by not less than 3 exposed screw threads.

Fabrication Tolerances: Fabricate cold-formed steel wall panels to a maximum allowable tolerance as

follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3mm) from the designed spacing. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate cold-formed steel wall panels to a maximum allowable out-of-square tolerance of 1/8 inch (3mm) within the length of the panel.

Fabricate panels square, with components attached in a manner so as to prevent racking or distortion.

Cut all framing components squarely for attachment to fit against abutting members. Hold members positively in place until properly fastened.

Fasteners: Fasten components using self-tapping screws or welding.

Welding: Welding is permitted on 18 gage, 0.0428 inch (1.22 mm)or heavier material only.
Specify welding configuration and size on the Structural Calculation submittal.
Qualify welding operators in accordance with Section 6.0 of AWS D.1.3.
Touch up all welds with zinc-rich paint in compliance with ASTM A 780.

Provide insulation as specified elsewhere in all double jamb studs and double header members, which will not be accessible to the insulation contractor.

Axially Loaded Studs:
Install studs to have full bearing against inside track web (1/8 inches (3.2 mm) maximum gap) prior to stud and track attachment.
Splices in axially loaded studs are not permitted.

EXECUTION

EXAMINATION

Prior to installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where this installation may properly proceed in strict accordance with framing shop drawings.

If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

INSTALLATION

General Installation Requirements:
Install cold formed framing in accordance with requirements of ASTM C1007.
Weld in compliance with AWS D.1.3.
Install in compliance with applicable sections of the LRFD Manual of Steel Construction.

Wall Systems:
Erect framing and panels plumb, level and square in strict accordance with approved shop drawings.
Handle and lift prefabricated panels in a manner so as not to cause distortion in any member.
Anchor track securely to the supporting structure as shown on the erection drawings. Install concrete anchors only after full compressive strength has been achieved. Provide a sill sealer or gasket barrier between all concrete and steel connections.
Butt all track joints. Securely anchor abutting pieces of track to a common structural element, or butt-weld or splice them together.

Align and plumb studs, and securely attach to the flanges or webs of both upper and lower tracks

except when vertical movement is specified.

Install jack studs or cripples below window sills, above window and door heads, at freestanding stair rails and elsewhere to furnish support, securely attached to supporting members.

Attach wall stud bridging in a manner to prevent stud rotation. Space bridging rows according to manufacturer's recommendations.

Frame wall openings to include headers and supporting studs as shown in the drawings.

Provide temporary bracing until erection is completed.

Provide stud walls at locations indicated on plans as “shear walls” for frame stability and lateral load resistance.

Where indicated in the drawings, provide for structural vertical movement using a vertical slide clip or other means in accordance with manufacturer’s recommendations.

FIELD QUALITY CONTROL

Inspection: Periodic special inspections are required by local code authorities.

Owner will hire and pay inspection agency.

Submit schedule showing when the following activities will be performed and resubmit schedule when timing changes.

Notify inspection agency not less than 3 days before the start of any of the following activities.

Inspections are required during welding operations, screw attachment, bolting, anchoring and other fastening of components within the force resisting structural system, including struts, braces, and hold-downs.

PROTECTION

Protect installed products until completion of project.

Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION